BUILD SMART

A CONSTRUCTION PRODUCTIVITY MAGAZINE

JUN / JUL 2018

CHANGING THE WAY WE BUILD

Building and Construction Authority

JUN / JUL 2018

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EDITORIAL ADVISOR
Jeanna Das

EDITOR
Joshua Woo

SUB-EDITORS
Rena Pang

DESIGN
PurpleCircle Design Pte Ltd

CONTRIBUTORS
Angela Lee, Cynthia Heng, Jaime Loong, Josephine Lee, Lena Ow, Linn Naing Win, Josephine Seet, Xanna Tan

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52 Jurong Gateway Road, #11-01,
Singapore 608550
Tel: 1800-342 5222
Fax: 6334 4142
Website: www.bca.gov.sg

If you would like to share best practices and the latest technologies that could improve construction productivity, we would love to hear from you. Please email us at bca_enquiry@bca.gov.sg.

CEO'S MESSAGE

Dear Readers,

With the strong en-bloc activity over the past year or so, we expect that this will soon translate into higher construction demand from the private sector, with more new projects being developed in the coming years. While this signals good news for built environment firms, it is equally important that we continue to make gains on the quality and productivity front, to deliver better quality homes in a cleaner, more efficient way which minimises disturbance to the neighbourhood. In order to meet these expectations, developers, consultants and builders can turn to the new technologies we have introduced over the past few years. Design for Manufacturing and Assembly (DfMA) will move labour-intensive onsite work offsite and together with automation, DfMA methods have improved construction efficiency and increased quality assurance. By adopting such approaches, firms will transform themselves and the industry in the process.

In this issue of Build Smart, we take a closer look at BCA's quality assessment schemes which are available for firms to subscribe to - namely, CONQUAS and Quality Mark - to further enhance the quality standards of their projects. Also, learn more about the Quality Housing Portal and how firms can use this as a unique selling point for property sales as well as to gain a competitive edge when tendering for projects.

Besides quality, the idea of "transformation" continues to gain traction among built environment firms. The term Integrated Digital Delivery (IDD) was introduced during the launch of the Construction Industry Transformation Map (ITM) last year. IDD enables project stakeholders to collaborate by facilitating seamless sharing and delivery of digital information, so that designs can be finalised early and we can minimise downstream mistakes which can otherwise prove costly, cause delays or undermine quality. We continue with our Construction ITM series in this issue with case studies of real-life application of IDD technologies and their potential benefits.

Remember, one does not have to be on this transformation journey alone. It is important for firms to grow or maintain strong partnerships with all stakeholders and even with competitors. Take the opportunity to learn together and leverage each other's expertise and experience. By doing so, we can transform the way we Build Singapore.

Mr Hugh Lim
Chief Executive Officer
Building and Construction Authority

QUALITY MATTERS!

Better sales success and more business opportunities are just two benefits BCA's stamp of approval for quality standards can bring builders. Is it time for you to come onboard with BCA's CONQUAS and Quality Mark schemes?

The CONQUAS and Quality Mark Scheme in a Nutshell

	CONSTRUCTION QUALITY ASSESSMENT SCHEME (CONQUAS)	QUALITY MARK (QM) SCHEME
WHAT IS IT	An independent quality assessment system which assesses quality objectively by measuring against workmanship standards and specifications.	An extension of CONQUAS – it is for new residential projects and is based on CONQUAS standards.
WHEN WAS IT INCORPORATED	1989	2002
WHAT IT ASSESSES	The assessment is divided into three main components - Structural Works, Architectural Works and M&E Works.	The assessment focuses on internal finishes and water-tightness tests for bathrooms/toilets in all dwelling units.
HOW IT ASSESSES	Sampling is based on Gross Floor Area(GFA) and distributed uniformly throughout the construction stage.	All dwelling unites in a residential project are checked
OTHER ASSESSMENT DETAILS	The scoring will be done on the works that are being inspected for the first time. This practice encourages contractors to do things right the first time.	No limit to the number of re-assessments. If the unit does not meet the standard at first assessment, the developer may rectify the inadequacies and apply for re-assessment.
WHO CAN SIGN UP	Assessment is compulsory for: • All public sector building projects with contract sums above $5 million under the Bonus Scheme for Construction Quality (BSCQ) • Private projects with CONQUAS requirement under URA/SLA/HDB/JTC land sale agreements Participation is voluntary for all other private sector building projects.	Open to all new private residential projects e.g. condominium, cluster housing, landed housing, residential units in mixed developments, etc. Participation is voluntary.

See What Quality Mark Assessors Look Out For

BCA QUALITY MARK

FLOOR
- Finishing
- Alignment & Evenness
- Crack & Damages
- Hollowness
- Jointing

CEILING
- Finishing
- Alignment & Evenness
- Crack & Damages
- Roughness
- Jointing

DOORS
- Gaps & joints
- Alignment & Evenness
- Material & Damages
- Functionality
- Accessories Defects

BATHROOMS
All bathrooms in the unit are ponded with water for 24 hours. The assessor will check for signs of leakage directly below the ponded bathroom.

COMPONENTS
These refer to fixtures like kitchen cabinets, wardrobes and sanitary ware. Assessors look out for:
- Gaps & joints
- Alignment & Evenness
- Material & Damages
- Functionality
- Accessories Defects

WALL
- Finishing
- Alignment & Evenness
- Crack & Damages
- Hollowness
- Jointing

MECHANICAL AND ELECTRICAL FITTINGS
These include switches, air-conditioners and etc. Assessors look out for:
- Gaps & joints
- Alignment & Evenness
- Material & Damages
- Functionality
- Accessories Defects

WINDOWS
- Gaps & joints
- Alignment & Evenness
- Material & Damages
- Functionality
- Accessories Defects

An Easier Search for Quality Housing

The Quality Housing Portal, created in September 2017, gives a one-stop platform to make comparisons of quality standards of private residential properties, developers and contractors.

BONUS POINTS FOR PRODUCTIVE TECHNOLOGIES

As of January 2017, developers and builders using productive construction methods such as DfMA and PPVC are awarded higher bonus points. This means a higher rank on the CONQUAS and QM scoreboards, and potentially more business success for you!

THE QUALITY MARK "HALL OF FAME"

A key feature of the portal is the publication of top 10 developers, contractors and private residential properties. The scoreboard is updated quarterly, so up your quality game to make it to the top 10!

LEARNING JOURNEY TO A FUTURE-READY CONSTRUCTION SITE

See what happens in a world where design and infrastructure errors are detected even before the actual construction of a building – where costly reworks will be a thing of the past, thanks to Virtual Design and Construction (VDC).

Officers from various Government Procurement Entities at the VDC Industry Sharing Session hosted by Greatearth Corporation Pte Ltd

On 30 January, close to 40 officers from Government Procurement Entities (GPEs) experienced the inner workings of VDC first-hand on a visit to the GEM Residences construction site.

GEM Residences is a condominium project which uses VDC to improve project delivery workflows.

The VDC approach enables project team members to simulate onsite installations on a virtual platform before commencing on actual construction. This reduces costly and time-consuming reworks. Using BIM also enhances collaboration and sharing of information amongst team members. Greatearth Corporation, the project's main contractor, shared on how adopting Building Information Modelling (BIM) and VDC helped its team enhance collaboration and information-sharing processes.

Because the BIM-VDC approach was adopted in the early stages of construction, challenges faced in critical areas were mitigated. Mr Teh Seng Kong (Vice President, Design & Development of Greatearth), shared that the approach enabled the team to avoid reworks on critical areas such as:

- Coordination of architectural, structural and Mechanical & Electrical (M&E) services within Prefabricated Bathroom Units (PBU);
- Coordination of the concealed M&E services in the Link Bridge; and
- Compliance with Universal Design requirements at the Multi-Storey Car Park Roof Top.

This resulted in benefits including:

- Minimised instances of design revisions;
- Optimised manpower for production of shop drawings;
- Optimised Request for Information (RFI) response time; and
- Minimised material wastage from the industry's benchmark.

The Greatearth team also shared on:

1. Using the "BIG Room" concept* for intensive coordination meetings

2. 

Having clear VDC objectives and performance metrics to improve work processes;

3. Deploying BIM to track "Virtual" vs. "Actual" installation of PBUs to reduce instances of costly reworks;

4. Coordinating of concealed MEP services to prevent unnecessary hacking and reworks onsite;

5. Adopting technology to validate defects and take inventory of architectural and sanitary fixtures; and

6. Using QR codes to provide precise information on specific locations in residential units

** The "BIG Room" concept refers to having collaboration in a co-located space.*

Hear from the Participants!

> **The visit demonstrated that a systematic approach to the adoption of VDC can bring about great benefits for both developers and contractors. HDB looks forward to working closely with the industry to promote VDC adoption.**
>
> **MR CHONG SHYH HAO**
> Architect, HDB

> **The use of technology presents us with opportunities for further data mining.**
>
> **MR GARVIN GOH**
> NUS

MAXIMISING PRODUCTIVITY AND MINIMISING RISKS WITH TECHNOLOGY

Delivery errors and delays often result in costly consequences for construction firms. One company found a way to mitigate these risks.

BACKGROUND

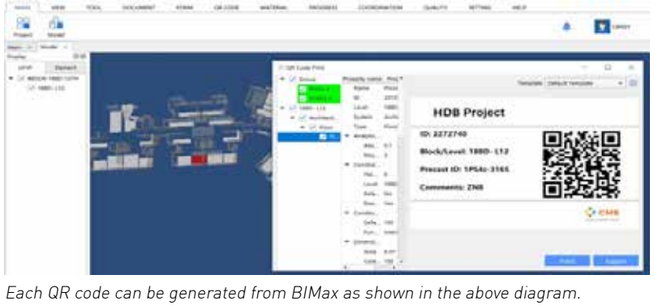
Bedok N3C20 (Fengshan Greenville) is a residential construction project by China Construction (South Pacific) Development Co (CCDC). The site is surrounded by HDB flats, a school, shops and a hawker centre. Having such establishments in close proximity meant a tight space for construction activities. There is also the need to reduce noise pollution and inconveniences to the public during the building phase. Such factors make the use of precast elements crucial for project success, as precast components generally do not require much onsite storage space, and also enable workers to minimise disruptions to the public arising from onsite construction.

CHALLENGE

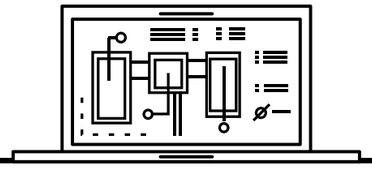
The CCDC team sometimes encountered issues that resulted in consequences such as late deliveries, delays in assembly, wastage of resources and more. This was caused by its previous method of communication to check on production statuses of the precast components - through emails and calls which do not guarantee up-to-date, immediate and accurate responses. Furthermore, precasters are not available around the clock to address queries.

SOLUTION AND BENEFITS

Recognising the need to adopt a technology to help the team track its precast materials better, CCDC, with the Housing & Development Board's support, adopted a BIM-based project management platform called BIMax Material Tracking System. The system automatically assigns a QR code to each precast element recorded in the BIM system. Users can easily retrieve information on their materials such as dimensions, weight, locations and delivery statuses without time- and resource-consuming paperwork. Information is better organised. Users can simply scan the QR code to update the material tracking status, and updates will reflect on BIMax in real time for all project stakeholders to view.



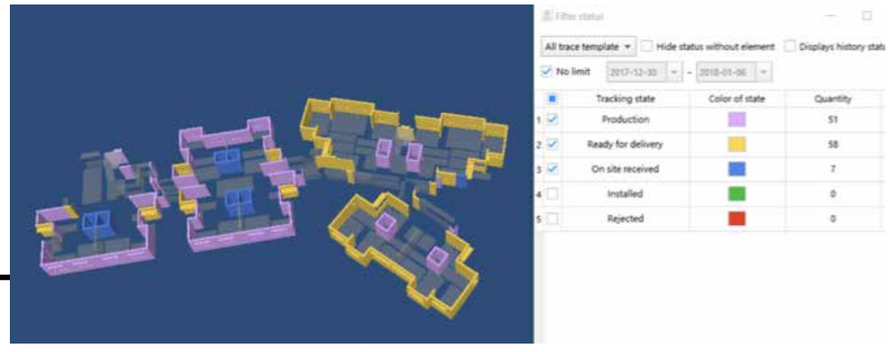
Each QR code can be generated from BIMax as shown in the above diagram.



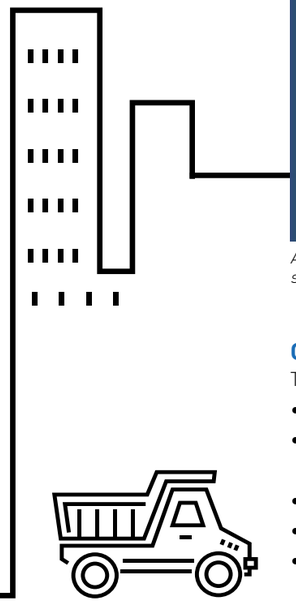
For the Fengshan Greenville project, the materials tracking cycle involves the main contractor and the manufacturer. Here's an example of a typical tracking process.

PRODUCTION	READY FOR DELIVERY	RECEIVED ONSITE	INSTALLED
MANUFACTURER	MANUFACTURER	MAIN CONTRACTOR - STOREMAN	MAIN CONTRACTOR - SITE ENGINEER
			
1) Cast Precast Component (PC) 2) Print QR code 3) Scan QR code to update status	1) Paste QR code on casted PC 2) PC loaded onto trailer 3) Scan QR code to update status	1) Received PC on site 2) Scan QR code to update status	1) PC assembled on site 2) Scan QR code to update status

Besides updating material statuses, the system also keeps records of when and where components are scanned. This helps the team account for its precast materials at all times.



A screenshot showing how each element is reflected on the system in real time, keeping users updated on the status of each precast component



OUTCOMES

This shared platform:

- Enhances communication amongst stakeholders, leading to increased project productivity;
- Ensures that the correct precast components are always delivered according to schedule, as the system tracks every single component and sends notifications of errors in advance;
- Reduces manpower and time required to manage deliveries of precast materials;
- Enables team members to focus better on other higher-value tasks; and
- Empowers all stakeholders to collaborate and access real-time project information, from wherever they are as the platform can be accessed through computers and mobile devices.

WORKING SMARTER, LEANER AND BETTER

A new digital tracking system transforms the way main contractor Greatearth monitors the movement of its materials. Mr Teh Seng Kong, Vice President, Design & Development, Greatearth Construction Pte Ltd, tells us more.

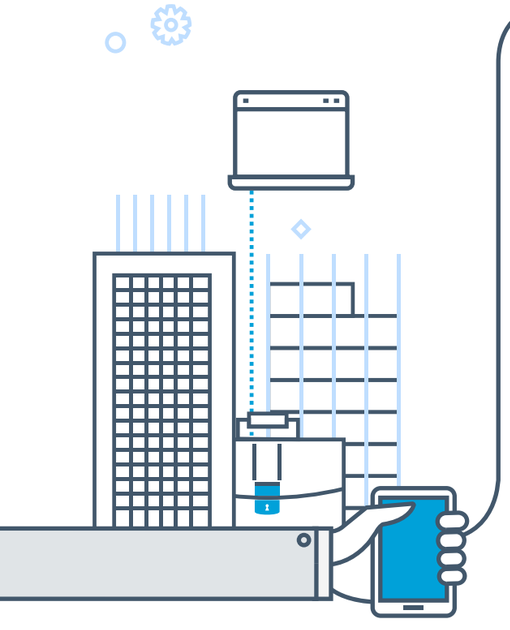
PLEASE SHARE WHY YOUR TEAM SAW THE NEED TO DIGITISE THE MATERIALS TRACKING PROCESSES.

Mr Teh: Like many companies in the traditional construction industry, we were facing challenges in manpower management and materials tracking for precast and prefabricated elements. Conventional tracking methods are heavily reliant on manual inputs – tracking typically involves a significant amount of paperwork and Excel spreadsheets. Such processes were time- and resource-consuming, and were not as organised and error-free as we would have liked them to be.

To mitigate these challenges, we partnered Astoria Solutions, a company specialising in cloud technology for the marine, oil & gas and construction industries. The Greatearth-Astoria team, facilitated by BCA, devised a digital solution called astorWork.

HOW HAS ADOPTING A DIGITAL SOLUTION IMPROVED YOUR TEAM'S WORK PROCESSES?

Mr Teh: We now have better control over delivery as well as scheduling of installations. Also, because we can monitor the project status in real time (and on a single platform), the need for manual monitoring is eliminated, which saves us time. The ability to track our materials' locations is another advantage as it reduces instances of us having to search for the materials we need, or paying to re-order or arrange for re-delivery of misplaced materials. This solution also enables us to identify and rectify defects almost immediately, reducing unexpected situations during installation and potentially costly delays. Overall, we have seen reduced wastage of materials. Moving on, we also expect to be able to accelerate our project schedule even more by utilising a digital solution as we further enhance our planning and coordination efforts.



TELL US MORE ABOUT HOW THIS DIGITAL SOLUTION WORKS.

Mr Teh: We applied astorWork on our Senja Ridge project, a residential block along Senja Road. This solution combines Astoria Solutions' RFID (radio frequency identification) sensor-to-cloud technology and BIM software integration capabilities. It tracks construction materials in real time while they are being transported from manufacturers'/suppliers' facilities to our construction site for installation.

Here's how it works:

Prefabrication stage: The prefab vendor assigns RFID tags to all the precast elements in the production stage.

Storage stage: Upon receiving the precast elements, the site supervisor scans the RFID tags after ensuring that everything is in good condition.

Installation stage: Before installation, the site supervisor scans the RFID tag to ensure that the correct precast element is being installed in the right place.

All the scanned data is automatically synced with the team's BIM system in real time, and is easily accessible via all team members' computers and mobile devices.

An illustration of how the materials tracking solution works

ENRICH YOUR SKILLS AND KNOWLEDGE AT BCA ACADEMY!

With built environment techniques and technologies evolving rapidly, staying on top of the latest innovations is more important than ever – and BCAA's got you covered with its upcoming events and courses.

From one-day events, short courses, specialist diplomas to full-time degree programmes, there's something for everyone.

UPCOMING EVENTS AT BCA ACADEMY

The following events will be conducted at BCA Academy,
200 Braddell Road, Singapore 579700

EVENT CODE: 78087

COMPUTATIONAL BIM

27 & 28 AUG 2018 | 9.00AM TO 6.00PM

The Computational BIM approach enables professionals from the built environment industry to explore and automate more design options leading to desired solution for productivity gains. The design approach also makes the creation of complex geometry possible and accurate.

This two-day workshop covers the practical applications, modelling workflow and integration of model with BIM software to enhance the design process. Participants will be equipped with practical computational BIM skills and technical knowledge through hands-on sessions. Industry practitioners will also be invited to share their experience in adopting computational BIM in their projects or workflows.

EVENT CODE: 80025

SAFE BUILT ENVIRONMENT THROUGH EFFECTIVE BUILDING CONTROL AND INNOVATIVE SOLUTIONS

25 SEP 2018 | 9.00AM TO 5.00PM

In recent years, innovative solutions have been adopted to enhance construction productivity and promote sustainable construction. As we continue to transform our built environment, it is also important for industry stakeholders to ensure structural safety when carrying out the building works. BCA will be sharing best practices as well as shortcomings observed in both the design and construction of building works, while industry experts and professionals will share innovative solutions adopted in Singapore construction in recent years.

EVENT CODE: 73099

PROJECT MANAGEMENT FOR PROFESSIONALS IN THE BUILDING AND CONSTRUCTION INDUSTRY

28 SEP – 13 NOV 2018 (12 EVENINGS) | 6.30PM TO 9.30PM

The management of construction projects requires knowledge of modern management as well as an understanding of the design and construction process. The role of project managers is to direct and co-ordinate the processes and resources during the life cycle of a project to achieve the project's objectives.

This course will equip participants with the necessary knowledge on the practices of project management to successfully manage a building project through all stages of implementation.

EVENT CODE: 80022

MAINTENANCE OF ELECTRICAL EQUIPMENT FOR FM PERSONNEL

12 OCT 2018 | 9.00AM TO 5.00PM

Proper operation and maintenance of major electrical equipment are important factors in increasing equipment reliability, extending equipment lifetime and ensuring high levels of health and safety for building users and operation as well as maintenance personnel.

This course aims to provide awareness of the maintenance practices of an electrical installation for Facilities Management (FM) personnel and non-electrical engineers required to carry out building maintenance works.

WTU and other funding may be available for these courses (terms and conditions apply).

To register, please go to the BCA Academy Online StoreFront (OSF) at https://eservices.bcaa.edu.sg/registration/#/login and enter the event code into the search box.

COURSES

EVENT CODE: 79019

SPECIALIST DIPLOMA IN MEP MODULARISATION (SDMM)

SDMM starts on
28 AUG 2018
Registration closes on
17 AUG 2018

Course Enquiries:
Harry_Woon@bca.gov.sg
Enrolment Enquiries:
Nicholas_Soh@bca.gov.sg

The capability of the MEP (Mechanical, Electrical and Plumbing) sector of the construction industry must be enhanced to contribute to the increase in productivity. The Specialist Diploma in MEP Modularisation (SDMM) has been developed to do just that.

The SDMM programme aims to equip MEP professionals and contractors with the knowledge and good practices of offsite planning, designing and installation of Modular MEP Systems (MMS). Students will learn how to design and construct various types of MMS ranging from modular run, riser and platform using BIM. New approaches and technologies associated with jointing methods for MEP services will be included.

Students will undergo an experiential learning process. Fifty percent of total contact hours will be allocated to BIM modelling for MEP and computational BIM design for the development of MMS. Students will also have the opportunity to interact with specialists and professionals during workshop sessions with external speakers and go onsite visits.

EVENT CODE: 74019

SPECIALIST DIPLOMA IN FACILITY AND ENERGY MANAGEMENT (SDFEM)

- **CERTIFICATE IN FACILITIES MANAGEMENT (MC-A)**
- **CERTIFICATE IN BUILDING MANAGEMENT (MC-B)**
- **CERTIFICATE IN ELECTRICAL & ENERGY MANAGEMENT (MC-C)**

SDFEM and MC-C starts on
3 SEP 2018
Registration for SDFEM or MC-C closes on
3 AUG 2018

Course Enquiries:
Fadzli_Hassan@bca.gov.sg
Enrolment Enquiries:
Nicholas_Soh@bca.gov.sg

Environmental sustainability is increasingly gaining ground in the building and construction industry, buoyed by global concerns on climate change and limited natural resources. With the rising trend towards green technologies and renewable energy in the built environment, there is a need for professionals who are proficient in energy management to operate buildings for optimal building performance.

The SDFEM equips students with the essential knowledge to plan and manage building operations and maintenance efficiently. The programme also incorporates Energy Management modules to give them a competitive edge.

This programme is also available as separate stackable modular certificates. Attainment of all three module certificates will lead to the award of the Specialist Diploma in Facility and Energy Management (SDFEM).

Check out the other Specialist Diploma courses offered by BCAA at:
https://www.bcaa.edu.sg/what-we-offer/academic-programmes/specialist-diploma

FULL-TIME DEGREE PROGRAMMES
CONFERRED BY THE UNIVERSITY OF NEWCASTLE, AUSTRALIA

BACHELOR OF CONSTRUCTION MANAGEMENT (BUILDING) (HONOURS)

Course Enquiries:
bernice_ang@bca.gov.sg

Enrolment Enquiries:
Full-Time Programme
Zhuo_Xiuyun@bca.gov.sg

Part-Time Programme
Elaine_chow@bca.gov.sg

Every construction project combines a variety of complex challenges. The Bachelor of Construction Management (Building) (Honours) programme will equip you with the skills and knowledge to manage complexities in construction projects in Singapore and across the world. The programme incorporates content such as Building Information Modelling (BIM) and projects which offer a niche specialty beyond the construction management discipline.

Graduates can embark on diverse and exciting career opportunities as BIM Managers, Construction Managers, Project Managers, Quantity Surveyors, Facilities Managers, Property Developers, self-employed Consultants and more.

Full-Time (11th Intake): Starting in July 2018
Part-Time (5th Intake): Starting in July 2018

BACHELOR OF CIVIL ENGINEERING (HONOURS)

Course Enquiries:
lim_yaw_shyan@bca.gov.sg

Enrolment Enquiries:
Ang_Geok_Lung@bca.gov.sg

Civil Engineers are highly demanded in Singapore. In fact, Civil engineering is vital to Singapore's drive in creating a better built environment and liveable city. The development of mega infrastructure projects, as well as reshaping Singapore's city landscape will require highly-qualified engineers trained in civil disciplines. As we build higher and dig deeper underground, there are high prospects for Civil Engineers to design, plan, build, manage and oversee these exciting projects. This degree programme is designed to allow both GCE 'A' level and diploma graduates a pathway to pursue a rewarding career in the built environment.

4-year Pathway (Intake 3A): Starting in July 2018

Students can apply for the BCA-Industry Built Environment Undergraduate Scholarship/Sponsorship (Terms and conditions apply.)

Find out more about BCAA's Academic Programmes here:
https://www.bcaa.edu.sg/what-we-offer/academic-programmes

NO.	DATES	EVENT	VENUE	ORGANISER	CONTACT PERSON & DETAILS
1	30 & 31 Jul 2018	Construction Contract Aministration (Re-run)	BCA Academy, 200 Braddell Road	BCA Academy	Customer Services Tel: 62489999 email: bca_academy@bca.gov.sg
2	31 Jul, 1, 2 & 3 Aug 2018	Certification course in BIM Modelling (Structure Track) 13th Run			
3	1 & 2 Aug 2018	CP5 on Low Voltage Electrical Installations (9th Run)			
4	6, 8, 13, 15 & 20 Aug 2018, evenings	Geotechnical Design using Eurocode 7 (17th Run)			
5	7 & 8 Aug 2018	Performance-Based Design for Fire Safety – Smoke Control Design (6th Run)			
6	8 Aug 2018	Preparing & Defending Loss & Expense Claims (28th Run)			
7	13 Aug 2018	CP88 on Temporary Electrical Installations (6th Run)			
8	13 - 16 Aug 2018	Certification Course in BIM Management (76th Run)			
9	13, 15 & 20 Aug 2018	Application for Extension of Time – Factors for Success (10th Run)			
10	14 Aug 2018	Good Industry Practices – Marble/Granite/Ceramic Tiling (Re-run)			
11	14 & 15 Aug 2018	BIM Scheduling and Process Management (5th Run)			
12	16 & 17 Aug 2018	Designing and Constructing CLT & Glulam Structures (4th run)			
13	16, 17, 21, 22, 29, 30 Aug & 6 Sep 2018	Lift and Escalator Course for Engineers (8th Run)			
14	20 & 21 Aug 2018	Effective People Management for Construction Professionals (4th Run)			
15	23, 24, 30 & 31 Aug 2018	Certification course in BIM Modelling (MEP Track) 17th Run			
16	27 & 28 Aug 2018	Computational BIM **NEW**			
17	31 Aug 2018	Green Architecture & the Integrated Design Process (5th Run)			
18	3 Sep 2018	The Basics of Design for Manufacturing and Assembly (DfMA) (4th Run)			
19	6 & 7 Sep 2018	Certification Course on BIM for MEP Coordination (7th Run)			
20	13 Sep 2018	Planning, Design, Construction & Commissioning of Staircase Storey Shelters (5th Run)			
21	28 Sep – 13 Nov 2018 (12 evenings)	Project Management for Professionals in the Building and Construction Industry (14th Run)			
22	Starting on 1 Aug 2018 (Evening classes) (Duration: 9 months)	Specialist Diploma in Construction Management (24th Run)		BCA - University of Newcastle	Ms Bernice Ang (Programme) / Ms Zhuo Xiuyun (Enrolment) Tel: 62489944 / 6248 9881 email: bernice_ang@bca.gov.sg / zhuo_xiuyun@bca.gov.sg
23	Starting on 2 Aug 2018 (Evening classes) (Duration: 9 months)	Specialist Diploma in Building Cost Management (19th Run)			Er Lim Yaw Shyan (Programme) / Ms Ang Geok Lung (Enrolment) Tel: 62489915 / 6248 9887 email: lim_yaw_shyan@bca.gov.sg / ang_geok_lung@bca.gov.sg
24		Specialist Diploma in Underground Construction (2nd Run)			
25	Starting on 27 Aug 2018 (Evening classes) (Duration: 5 months Theory + 4 Months Final Projects)	Specialist Diploma in Design for Manufacturing & Assembly (4th Run)			
26	Starting on 29 Aug 2018 (Evening classes) (Duration: 5 months Theory + 4 Months Final Projects)	Specialist Diploma in Lean Construction (5th Run)			
27	Starting on 28 Aug 2018 (Evening classes) (Duration: 5 months Theory + 4 Months Final Project)	Specialist Diploma in MEP Modularisation **NEW**			
28	Starting on 27 Aug 2018 (Evening classes) (Duration: 9 months)	Specialist Diploma in Interior and Landscape Design (30th Run)			

CONSTRUCTION PRODUCTIVITY AND CAPABILITY FUND (CPCF)

WORKFORCE TRAINING AND UPGRADING (WTU) SCHEME

Facilitates upgrading of workforce at all levels by co-funding up to 90% of the cost for selected skills assessment and training courses*

MECHANISATION CREDIT (MECHC) SCHEME

Provides assistance to builders to defray up to 70% of equipment costs*

PRODUCTIVITY INNOVATION PROJECT (PIP) SCHEME

Provides assistance to companies to defray up to 70% of the cost for adopting more productive work processes*

SCHOLARSHIP AND SPONSORSHIP PROGRAMMES

In partnership with built environment firms, BCA will co-fund scholarship and sponsorship programmes at the undergraduate, diploma, ITE, supervisory and foreman levels*

BUILDING INFORMATION MODELLING (BIM) FUND

Co-funds up to 70% of the supportable cost incurred by firms when leveraging BIM technology to improve multi-disciplinary collaboration*

Terms and conditions apply.

For more information, please visit **www.bca.gov.sg/CPCF/cpcf.html**

Building and Construction Authority

We shape a safe, high quality, sustainable and friendly built environment